

THE HARVARD-MONSANTO RELATIONSHIP

December, 1975

Questions have been and continue to be raised about the nature and purposes of the agreements, now in effect for more than a year, entered into by Monsanto and Harvard — how this arrangement will serve each of the participants and whether this kind of a relationship has real potential for providing substantial benefits to society in general.

From an historical point of view the nature of the relationships of America's colleges and universities with our society has been a changing one throughout our two hundred year experience as a nation, changing on the basis of needs as society perceives them from time to time. Consistently, however, the nation has turned to these institutions for the education of its leaders and for the means to solve technical and social problems. Private individuals have contributed to the support of colleges and universities since colonial days. State support of higher education began in the 19th century. Recognition of the value of specific functions and programs of institutions of higher education by the federal government began after the Civil War but grew most rapidly in scope, in importance, and in complexity after the end of World War II. A majority of those affected would hold that such support has benefited not only the institutions and their students, but society as a whole. Because of the sums involved, as well as the political considerations, concern with the development and evolution of these governmental relationships has preoccupied the attention of most university administrators and faculty. As a not unexpected result, little attention has been paid to the benefits which might come from the development of new patterns of interchange between educational institutions and industry. Such benefits, in Harvard's current view, might be most immediately realizable in the biological and health areas, through arrangements which could provide stable resources for University programs and accelerate the development of new products and processes in areas where society's needs are particularly great.

At present federal support of the scientific, medical, and technical disciplines in the University is almost all pervasive. In spite of some initial concern, such support of university activities has not led inevitably to the destruction or even the diminution of the values of freedom of inquiry and independence of thought and expression. Educational institutions have attempted with some success to clearly state and maintain their roles and

rights in their relationships with federally-supported programs. This they can also do in dealing with industry - more effectively in fact, as they will not be dealing with a single (albeit multi-tentacled) organization endowed with the power to legislate if it cannot persuade.

Finally, there is a substantial element of omission in present Federal-University relationships. There is no assumption of responsibility on either side for initiation of or for facilitating the transfer of new ideas which stem from their interrelationships into new products or processes - this transfer is seemingly left entirely to chance.

Industry is surely concerned with those things that contribute to its day-to-day profitability, but is more deeply concerned about the lack of meaningful relationships to new and potentially significant developments in science and the consequent lack of participation in, access to, and development of the new knowledge that will enhance its ability to provide new and needed products.

For the last several decades most biological and medical research in the United States has been carried out in universities, medical and dental schools, teaching hospitals, research institutions, and governmental institutions with its major support coming from government and some from private philanthropic sources.

Industry by and large has been a non-participant in such biological and medical research and hence is comparatively isolated from the main stream of modern biologic thought. As a result, the development of useful products, i.e., the development of a biologic-based technology based on current research efforts has not come generally into existence except in the pharmaceutical segment of the chemical industry where there are extensive development programs relating to medical therapeutics. Harvard University and Monsanto Company, on the basis of relationships maintained over more than a decade between key individuals in each organization, have come to understand from each other what the power of a joint university-industry approach to research and development in modern biology might be, and made their decision to explore its practicality.

The agreements between Harvard University and Monsanto Company attempt to utilize the strengths of both to serve the purposes of each and at the same time to serve the public interest. For the University these agreements specifically provide for the maintenance of traditional freedoms; for Monsanto they provide access to a rapidly growing field of biological and medical knowledge. Both Harvard and Monsanto are committed to manage their respective activities so as to protect the public interest in the utilization of any new inventions or discoveries which may be made and to pursue the development of new and useful products and processes. Oversight of these particular responsibilities has been placed in the hands of an Advisory Board whose members are drawn from both the scientific and public affairs communities and who have no association with Harvard or Monsanto.

During the course of their discussions, it was accepted by Monsanto and Harvard that to provide more and better food, better health, and a better environment requires new and improved materials, techniques, and systems all based on a better understanding of biology together with the ability to utilize this understanding in a practical way. To best achieve these goals both Harvard and Monsanto agreed that each must define and maintain its basic identity and objectives, but create a framework which would assure responsiveness to the public interest. Thus throughout the period of discussions and explorations between Harvard and Monsanto attention has been continuously focused on how best basic institutional objectives might be defined and safeguarded and how together both institutions might most effectively define and establish joint and continuing concern for the public interest as an integral part of any agreement between them.

Exploration, discussion, and resolution of these general issues took many months. Additional months were spent in achieving a detailed understanding and eventually in accommodating to the differences fundamental to the two types of organizations. For example, scientific staff in industry works with the understanding that the product wanted defines the research and development to be undertaken. Professors in a university define their own research objectives subject to the availability of resources and the balance of activity within the institution. Collectively, they are the university which

protects and assures their individual initiative. The association between Monsanto and Harvard specifically recognizes and respects these essential differences between the partners.

A series of three agreements entitled respectively "Statement of Principles", "Charter Agreement", and "Project Agreement" between Harvard and Monsanto became effective November 1, 1974. These agreements provide for Harvard certain general benefits together with consequential support of research carried out in the laboratories of two members of the Harvard Medical Faculty, Dr. M. Judah Folkman and Dr. Bert L. Vallee, in laboratory facilities presently located at the Children's Hospital Medical Center and at the Peter Bent Brigham Hospital (the latter now a part of the Affiliated Hospitals Center). In addition to providing capital funds, the agreements provide for the direct expense of certain of Dr. Folkman's and Dr. Vallee's research activities. This support may amount to as much as \$23,000,000 over the twelve-year period of association called for by the agreements. Over and above its financial contribution, Monsanto will potentiate aspects of these investigators' work not otherwise possible by supplying substantial quantities of precursor materials. This Monsanto is uniquely equipped to do on the basis of its own current research, development and pilot production programs.

For Monsanto, these agreements provide informed and intimate access to current research activities in biology and medicine, assistance in developing its own research capability in these areas, and the opportunity to develop and market such new and useful products as may result from the collaborative activities. Put another way, there is provided for Monsanto a window through which it may view the courses of current research in biology and medicine, and help in developing the ability to utilize the knowledge thus gained in the creation of new technology. Such technology will inevitably lead to new products and create new markets by better meeting basic human needs.

The area of science in which Monsanto and Harvard have initially agreed to collaborate is aimed at achieving a better understanding of the mechanisms of action and structural-functional relationships of macro-molecules, particularly of proteins and other materials which serve in catalysis, in hormonal action or in other "messenger" functions. The work at Harvard will

continue the investigations already begun and underway involving vascularization in general, and especially tumor angiogenesis factor (TAF) -- its mode of action and potential mechanisms of inhibition. In the context of the agreements, the choice of problems to be investigated is explicitly and solely the province of the Harvard investigators. Initially Monsanto's efforts under the direction of Dr. Bernard Wildi, Monsanto Distinguished Science Fellow, will principally involve scale-up and supply of materials to Harvard for use and testing and will later involve investigation and development of practical products, development and engineering for manufacturing processes, and design and development of optimal distribution and marketing system.

It was agreed at the outset that the objectives of Harvard and Monsanto were different but that each was essential to the other in reaching its own goal. It was also agreed that the role of government and private philanthropy in support of biologic and medical research must be both acknowledged and supported, and that appropriate steps must be taken in formulating any relationship to ensure that the interests of the public were not only protected but advanced. To accomplish all of these aims the agreements contain specific provisions concerning freedom of publication of research results, recognition of the major role of government and private philanthropy in the support of research in biology and medicine, and the importance of prompt and effective development and marketing at reasonable cost of products stemming from the joint activities. Even though the actual language of the agreements may seem somewhat stilted, it seems best to quote from them as they bear on these areas of concern:

"--- in any attempt to formalize a working relationship between industry and a university around an area of major consequence, the objectives of each must be clearly stated and understood --- careful consideration of the public interest in the establishment of such relationships is essential ---"

From Statement of Principles

November 1, 1974

"The parties of this agreement recognize the primacy of the interests of the public in any matters affecting health or environment. The parties

further recognize the lack of precedents upon which to base governance of a cooperative arrangement between an academic institution and an industrial corporation ---. --- to obtain objective guidance and advice as to how best to take the public interest into consideration, the parties hereto will establish an Advisory Board."

"The Advisory Board shall be composed of individuals of recognized stature in academic, scientific, or public service pursuits who are not connected with Harvard or Monsanto. The Advisory Board shall express its views to Harvard and to Monsanto on the public interest aspects of publication and dissemination of information, and shall advise on the public interest aspects of such other matters as may be submitted to it ---".

"Both Harvard and Monsanto under any Project Agreement have the right to publish or otherwise publicly disclose information they have gained in the course of their respective investigation under a Field of Agreement, but each will give the other reasonable advance notice thereof."

"Harvard to the extent it is free to do so agrees to grant --- a world-wide license to Monsanto under all inventions or discoveries --- (made) --- in connection with the Project Agreement. --- The license shall be exclusive for a period of time ---".

"During the period of exclusivity --- Harvard may request Monsanto to grant a sublicense --- accompanying such request with a written statement of its reasons for believing such sublicensing is required in the public interest ---. If Monsanto shall not --- agree to comply with such request, Harvard may refer the matter to the Advisory Board. If the Advisory Board --- shall decide by a majority of its members that the granting of the requested sublicense --- is required in the public interest, Monsanto shall --- grant such sublicense ---".

"Monsanto shall have unrestricted title to and control of its own inventions and patents with the following exceptions regarding products covered by or made by a process covered by or whose use is covered by a Harvard patent licensed to Monsanto ---. If such a product is principally and

directly within the field of health and medical therapeutics and Monsanto within a reasonable time --- has not produced it or caused it to be produced and sold at a reasonable price, or if such a product is in other fields and Monsanto (within a stated period of time) --- has not produced it or caused it to be produced, then Harvard shall have the right to require Monsanto to license on reasonable terms one or more qualified applicants chosen by Harvard not only the required Harvard patent(s) but also any Monsanto inventions, patents, and know-how which have resulted from Harvard input to Monsanto work ---".

"Monsanto and all licensees and sublicensees under this Agreement shall comply with all applicable laws and governmental regulations from time to time in effect on quality in respect to products and processes licensed hereunder."

From Charter Agreement

November 1, 1974

"Each of Harvard and Monsanto under this Project Agreement shall have the right to publish or otherwise publicly disclose its information gained in the course of its investigation under the Field of Agreement, but each will give the other reasonable advance notice thereof."

From Project Agreement

November 1, 1974

Finally, it is important to stress at this time that both Harvard and Monsanto have other and vastly larger ongoing commitments to the broad fields of the life sciences. Harvard's expenditures, together with those of its affiliated institutions, for research and training in biologic and medical sciences exceeded \$60,000,000 during the year ending June 30, 1973, while Monsanto's research and development expenditures in its Agricultural division alone were in excess of \$9,000,000 for that year. What is hoped for from this new alliance is synergism --- the ability of each to accomplish more because of the presence of the other.